

Specular Reflectivity of Dental Hard Tissue Determined by Optical Time-Domain Reflectometry



H. Nathel^{†‡}, B. Colston^{†¥}, G. Armitage[‡], and L. Otis^{*}

[†]Lawrence Livermore National Laboratory

[‡]Department of Stomatology, U. C. San Francisco

[¥]Department of Biomedical Engineering, U. C. Davis

^{*}Department of Oral Diagnosis, University of Connecticut

Using optical time-domain reflectometry we are able to discriminate specular from diffuse reflections occurring at tissue boundaries. We have determined the specular reflectivity of enamel and dentin to be approximately 6.6×10^{-5} and 1.3×10^{-6} , respectively. Implications to periodontal imaging will be discussed.

This work was performed under the auspices of the U. S. Department of Energy by Lawrence Livermore National Laboratory under contract W-7405-ENG-48 and support for this research was provided from Grant 1 RO1 DE11154-01 from the National Institute of Dental Research.